

THE MEASUREMENTS OF A THOUSAND EXAMPLES OF A SHORT FORM OF TRYPANOSOME FROM A DOUBLE INFECTION

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STRAIN OF TRYPANOSOMES

The trypanosomes, an account of the measurements of which is given below, were derived from a horse naturally infected in the Gambia. This horse suffered from a double infection with two distinct species of trypanosome. An account of the animal reactions of these two species has already been published, and also the measurements of one of the species *T. vivax*, Blacklock (1912).

SPECIES OF ANIMAL HOST

The measurements were made from the parasites as they appeared in white rats. Two of these animals were chosen in which the disease ran an acute course, the parasites increasing from the first day of their appearance and becoming numerous in the blood at the time of the animal's death.

PLAN OF MEASUREMENT

A hundred parasites were drawn, in groups of twenty, on each of five days of the disease, in each rat. The number of days represented between the two rats is, therefore, ten, and the number of parasites drawn from each rat is five hundred.

METHOD OF FIXING, STAINING, DRAWING AND MEASURING

Thin films, made from the blood of the ear, were dried, fixed for five minutes in absolute alcohol, and stained with Giemsa's stain for twenty minutes. Non-dividing parasites (taken in order as they were found) were drawn in clear outline, with the help of the Abbé camera lucida, using No. 18 Zeiss compensating ocular with a 2 mm. apochromatic objective. The measuring was done by Stephens' method.

CONSIDERATION OF THE RESULTS OBTAINED

From Table I, where an analysis of the 1,000 trypanosomes is given, it will be seen that the average measurement of the 1,000 dealt with is 13.3μ , the maximum trypanosome measuring 19.5μ , and the minimum 9μ . Between the averages of the two sets of 500 each there is a difference of only 0.6μ , the first set averaging 13.0μ and the second 13.6μ .

In Table II the parasites are tabulated according to their percentage in microns under three heads, viz., those measuring less than 12μ , those between 12μ and 15μ , and those measuring 15μ and over.

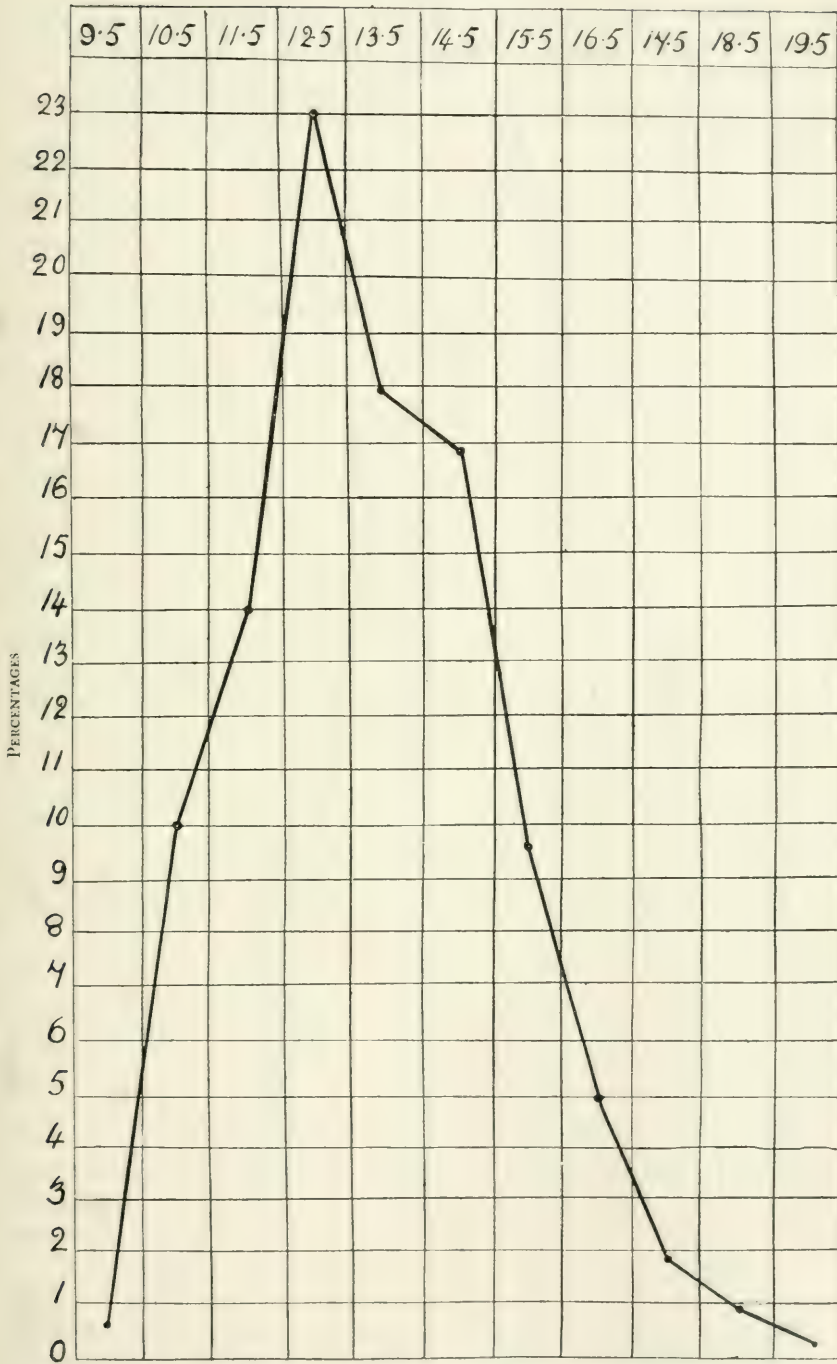
From this Table it will be seen that in each group, the 1,000 and the component 500's, the largest number of trypanosomes lies between 12μ and 15μ . In Charts I and II, which give for the groups of the short form a graphic representation of the percentages in length, the same fact is clearly shown.

It must be noted, however, on coming to smaller numbers than 500, and taking individual hundreds, that in one case of a hundred in the first rat, the largest number of trypanosomes measure less than 12μ , and in one case of a hundred in the second rat, the largest number measures more than 15μ . It would appear, therefore, that the measurement of small numbers of trypanosomes of this species might give somewhat less reliable results than in the case of *T. vivax*.

In Chart III the curves of the two trypanosomes are given side by side. It will be seen that the two curves lie almost completely apart, and that their apices are separated by 10μ .

CHART I.

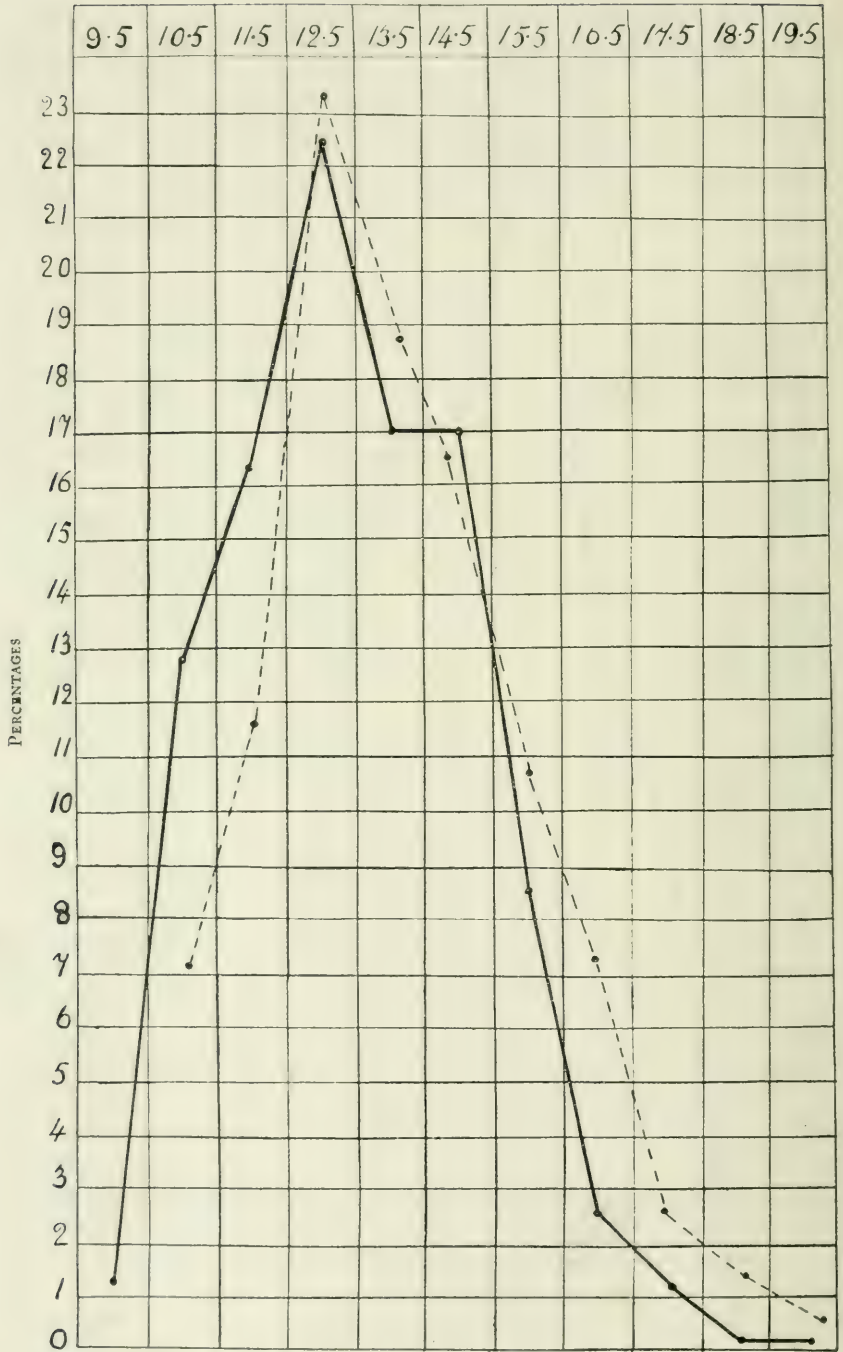
Length in microns



1000 trypanosomes of the short form measured on 10 days from two white rats

CHART II.

Length in microns



— 500 trypanosomes of the short form measured on 5 days from one white rat (1)
 - - - 500 " " " " " " " " " " " " (2)

CHART III.
Length in microns

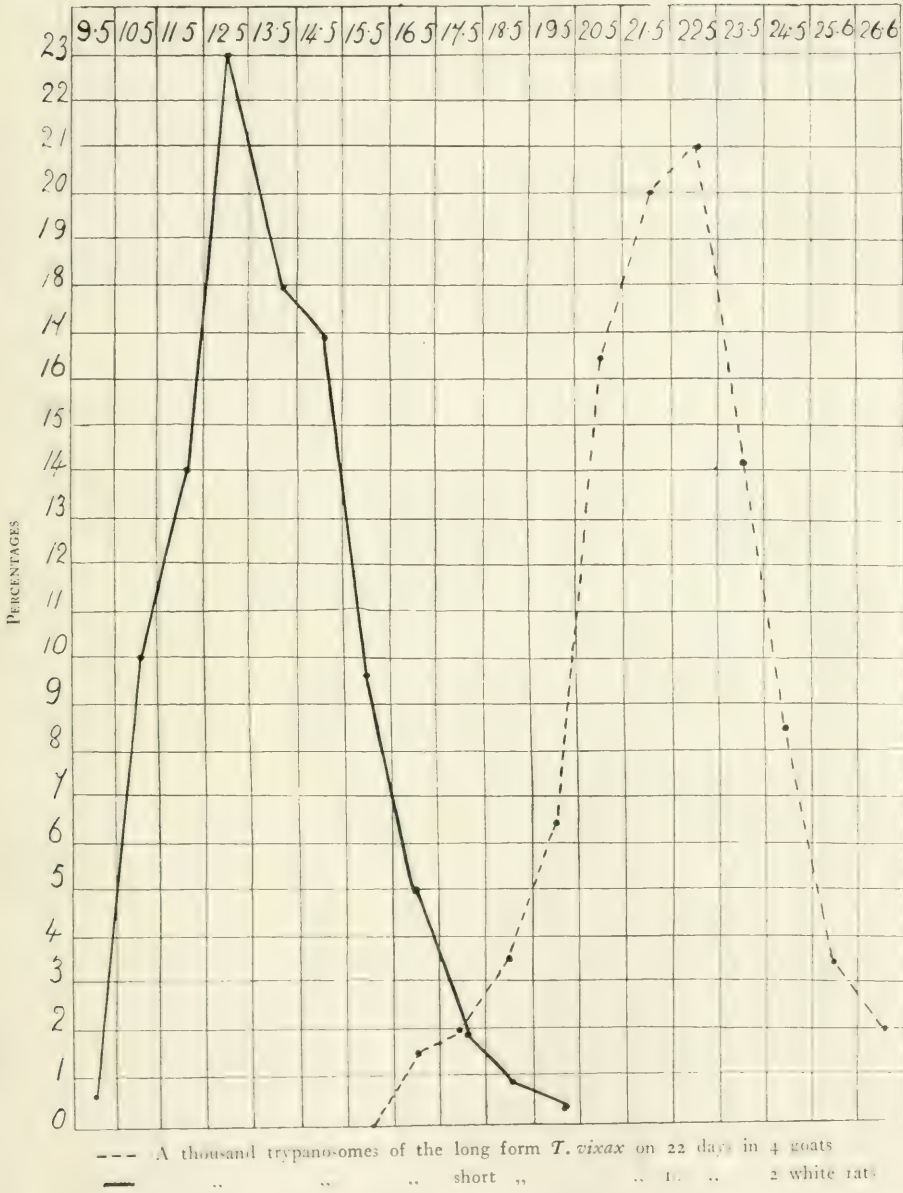


TABLE I. Analysis of 1,000 examples of the short trypanosome in white rats drawn and measured.

Number of trypanosomes measured	Number of animals represented	Number of days represented	Maximum trypanosome measured	Minimum trypanosome measured	In microns				
					Average measurement of total number drawn	Highest average in any group of 20	Lowest average in any group of 20	The shortest trypanosome in any group of 20	The longest minimum trypanosome in any group of 20
1,000 composed as under —	2	10	19.5	9	13.3	16.4	11.7	14.2	14.2
500	1	5	19	9	13	15.2	11.7	14.2	13.3
500	1	5	19.5	10	13.6	16.4	12.4	14.2	14.2

TABLE II. Showing percentage incidence according to length in microns of 1,000 examples of the short trypanosome, and of the groups composing the total

Number of trypanosomes	Number of rats from which drawn	Number of days represented	Percentage of		
			(1) Trypanosomes measuring less than 12 μ	(2) Trypanosomes measuring between 12 μ and 15 μ	(3) Trypanosomes measuring 15 μ and over
1,000 composed as under —	2	10	24.7	57.6	17.7
500	1	5	30.6	56.6	12.8
500	1	5	18.8	58.6	22.6

REFERENCE

- BLACKLOCK (1912). The Measurements of a Thousand Examples of *Trypanosoma vivax*.
Ann. Trop. Med. & Parasitol., Vol. V, No. 4, Feb., pp. 521-538.